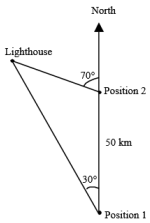
SINE LAW WKSHT

1. A ship is going north at 50 km/h. At position 1, the captain can see a lighthouse at a 30° angle on his left. One hour later, at position 2, the captain observes the same lighthouse, this time at a 70° angle on his left. **What is the distance between position 2 and the lighthouse?**



38.89 km

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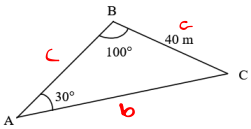
2. Three airplanes flying in formation at an air show form a triangle, as shown below. **What is the distance between plane A and plane C?**



$\frac{b}{\sin 100^\circ} = \frac{40}{\sin 30^\circ}$

$b = 78.78$ m

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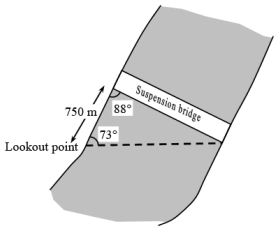
3. A suspension bridge is built across a river. A lookout point is 750 m from the bridge. Other measurements are indicated on the figure below. **What is the length of the suspension bridge**?

2203 m



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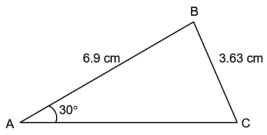
4. Given ΔABC below. **What is the degree measure of angle C**?

∠C = 76.88°

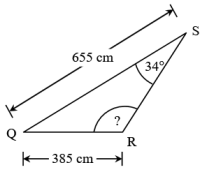


SINE LAW WKSHT

5. In triangle QRS on the right:

$m\angle QSR = 34°$
$m\overline{QR} = 385\text{ cm}$
$m\overline{QS} = 655\text{ cm}$

What is the measure of obtuse angle QRS?



$\angle QRS = 108°$

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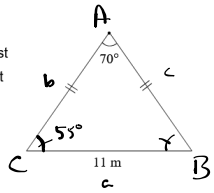
6. Kozy Korner is an A-frame ski chalet that was constructed last summer. It is 11 m wide and has two equal sides that meet at a 70° angle. **What is the length of one of the equal sides?**



① $\frac{180° - 70°}{2} = \frac{110}{2} = 55°$

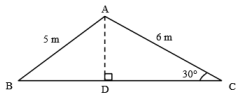
② $\frac{\overline{AB}}{\sin 55°} = \frac{11}{\sin 70°}$ $\overline{AB} = 9.59\text{ m}$

SINE LAW WKSHT

7. Given triangle ABC and its height AD:

What is the measure of angle ABC?

∠ABC = 36.87°

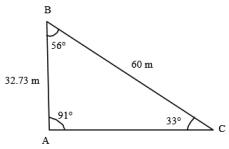


SINE LAW WKSHT

8. A yard is to be fenced. The yard's shape and dimensions are illustrated in the adjacent diagram. The fencing costs $7.95 per metre, taxes included.

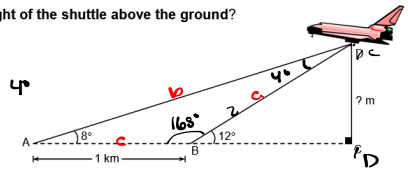
How much will the fence cost?

$1132.72



SINE LAW WKSHT

9. A space shuttle activated its landing gear just before landing. At that moment, the radar located at point A measured the angle of elevation of the shuttle to be 8°. The other radar, located at point B, measured the angle of elevation of the shuttle to be 12°. The radars are 1 km apart. **What is the height of the shuttle above the ground**?



① $\angle ABD = 180° - 12° = 168°$

$\angle ADB = 180° - 168° - 8° = 4°$

② $\frac{a}{\sin 8°} = \frac{1}{\sin 4°}$

$a = 2$

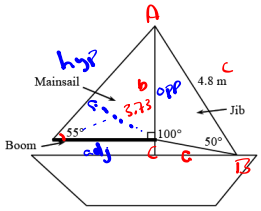
③ $\frac{2}{\sin 90°} = \frac{m}{\sin 12°}$ $m = 0.42 km$

OR

$\sin 12° = \frac{m}{2}$

SINE LAW WKSHT

10. Several measures are given on the adjacent diagram of a sailboat. Along the bottom of the mainsail is a pole called the boom. **How many metres long is the boom of this sailboat**?



① $\frac{b}{\sin 50°} = \frac{4.8}{\sin 100°}$ $b = 3.73$

② SohCahToa

$\frac{\tan 55°}{1} = \frac{3.73}{x}$ $x = 2.61 m$